TABLE 3.—*Free-air resultant winds (meters per second) based on pilot balloon observations made near 7 a. m. (E. S. T.) during September, 1930*—Continued

Altitude (meters) m. s. l.	Medford, Oreg. (410 meters)		Memphis, Tenn. (145 meters)		New Orleans, La. (25 meters)		Omaha, Nebr. (321 meters)		Royal Center, Ind. (225 meters)		Salt Lake City, Utah (1,294 meters)		San Francisco, Calif. (1.7 meters)		Saulte Ste. Marie, Mich. (198 meters)		Seattle, Wash. (14 meters)		Washington, D. C. (10 meters)		Phoenix, Ariz. (356 meters)		Brownsville, Tex. (12 meters)	
	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity
	°		°		°		°		°		°		°		°		°		°		°		°	
Surface	S 79 W	1.2	S 2 E	1.4	N 59 E	0.8	N 65 E	0.3	S 19 E	1.3	S 30 E	3.7	N 83 W	2.4	N 80 W	0.8	S 4 W	0.8	S 37 W	0.4	S 68 E	3.6	S 21 E	1.5
500	N 86 W	0.6	S 36 W	4.8	S 43 E	1.8	S 2 E	1.4	S 35 W	3.2	----------	----	S 78 W	3.1	N 88 W	4.1	N 89 W	1.3	N 77 W	3.5	S 64 E	3.4	S 3 E	6.5
1,000	N 68 W	0.8	S 64 W	4.1	S 12 E	2.8	S 56 W	4.9	S 78 W	4.4	----------	----	S 61 W	2.4	N 87 W	7.8	N 43 W	1.2	N 77 W	4.5	S 4 E	1.6	S 5 E	6.8
1,500	S 80 E	0.6	S 74 W	2.9	S 6 E	3.6	S 74 W	5.9	S 83 W	6.7	S 19 E	4.6	S 1 E	2.0	N 79 W	9.1	N 27 W	2.1	N 83 W	5.7	S 27 W	2.4	S 15 E	5.2
2,000	S 53 E	0.7	N 63 W	1.3	S 7 E	3.6	S 88 W	7.6	N 86 W	8.8	S 3 W	4.2	S 16 E	1.7	N 79 W	9.5	N 1 E	1.0	N 87 W	8.0	S 22 W	3.7	S 42 E	1.7
2,500	S 46 W	0.7	N 76 W	1.3	S 11 W	2.7	N 83 W	8.1	N 78 W	10.6	S 33 W	3.9	S 12 E	2.3	N 71 W	11.4	----------	----	N 86 W	10.3	S 24 W	4.9	N 60 E	1.4
3,000	S 19 W	1.8	N 57 W	2.0	S 34 W	1.6	N 76 W	9.7	N 84 W	10.4	S 57 W	4.6	S 17 W	2.5	N 65 W	12.7	----------	----	S 87 W	10.8	S 23 W	6.4	S 72 E	1.7
4,000	S 70 W	2.4	----------	----	N 81 W	2.0	N 66 W	7.6	N 75 W	9.1	S 67 W	6.2	S 38 W	4.2	----------	----	----------	----	N 89 W	12.6	----------	----	N 53 W	1.2
5,000	----------	----	----------	----	N 85 W	4.4	----------	----	----------	----	S 73 W	6.9	N 86 W	5.4	----------	----	----------	----	----------	----	----------	----	----------	----

TABLE 4.—*Observations by means of kites, captive and limited-height sounding balloons during September, 1930*

	Broken Arrow, Okla.	Due West, S. C.	Ellendale, N. Dak.	Groesbeck, Tex.	Royal Center, Ind.
Mean altitudes (meters), m. s. l., reached during month	2,721	2,937	3,296	2,507	2,653
Maximum altitude (meters), m. s. l., reached and date	[1] 4,141	[2] 4,264	[3] 8,384	[4] 4,024	[5] 4,580
Number of flights made	29	28	31	21	29
Number of days on which flights were made	29	28	30	20	26

[1] 15th. [2] 15th. [3] 29th.; limited-height sounding balloon observation. [4] 23d. [5] 5th.
In addition to the above there were approximately 130 pilot balloon observations made daily at 56 Weather Bureau stations in the United States.

WEATHER IN THE UNITED STATES

THE WEATHER ELEMENTS

By M. C. BENNETT

GENERAL SUMMARY

September was warmer than normal throughout the eastern half of the country, especially from the Carolinas to the New England States where the monthly means were from 4° to 8° above the normal, while they were near the normal in most sections from the Rocky Mountains westward; however, freezing weather occurred in the Northwest during the latter part of the month.

The droughty conditions that had prevailed in most sections were relieved early in the month over much of the Great Plains and the Ohio Valley, and toward the middle of the month throughout most sections from the Rocky to the Appalachian Mountains, although the upper Mississippi Valley and other north central areas continued dry, and the drought continued in the Middle Atlantic area. The latter part of the month brought additional rainfall in most sections except over much of the area from northern North Carolina to southern Pennsylvania, where the severe drought continued.

TEMPERATURE

The noteworthy tendency to abnormally high temperatures continued, especially in the northeastern portion. Since January, no month has averaged cooler than normal in the northern border strip from the Rocky Mountains to the middle of the Lake region, while in nearly every State east of the Plains at least six of the last eight months have been hotter than normal.

The first decade was mainly hot, expecially in the Atlantic and Gulf States, the central valleys and the far Northwest, but was slightly cooler than normal in most of the Lake region and the north-central portion, also in many interior districts of Oregon and California. The middle decade and the first portion of the last decade were warm in most sections, though much of the far West and portions of the Gulf States were colder than normal, at least during part of this period. The final week was cool, save in the eastern third and the central valleys; the Atlantic States had unseasonably warm weather till the 27th or 28th, when a change to cooler reached them.

The temperature of the month averaged above normal practically everywhere save in California and the southern plateau region and in most of North Dakota. From North Carolina northeastward the month was much warmer than normal, being at many places the hottest September since 1881, and at a few the hottest ever recorded.

The highest readings were noted usually during the first four days in the eastern third of the country and in the far West. In the middle portion of the country they occurred, as a rule, at various later dates, but seldom after the 18th. For the most part, previous September records, especially those made in 1881 or 1925, were not exceeded.

The lowest marks were usually reached during the final week, though in some States along the northern border they occurred before the middle of the month. There were but few States where they closely approached the previous records.

PRECIPITATION

Considerably more than half of the country received less than the normal September rainfall, yet important regions had partial or complete relief from the serious drought of earlier months. From Kansas, Missouri, and the lower Ohio Valley southeastward liberal rainfall was the rule, with considerable benefit to late crops and pasturage, particularly as the principal rains in this area occurred before the middle of the month, save near the east Gulf and south Atlantic coasts, where they were mostly very heavy, falling chiefly after the middle of the month.

On the other hand, the Southwest, the northern Plains and the Lake region received mainly less rain than normal. In North Dakota, Oklahoma, and Texas, this was the fourth dry month in succession, and in most of the Lake region the third.

Dryness in September was particularly notable from the upper Ohio Valley and North Carolina northeastward. A very large part of this section received less than half of the September normal and considerable districts less than a quarter. Furthermore, for much of the area it was the seventh or eighth or sometimes even the tenth dry month in succession, while in Maryland and Virginia no month since June has brought even half of the normal rainfall. Naturally water supplies have been greatly depleted and pastures are in wretched condition in the drier portions.

The far West showed some diversity as to rainfall, but the middle and northern portions of the plateau region and most of Oregon received somewhat more rainfall than normal.

SNOWFALL

During the final week the Black Hills region received more snow than usually occurs there in September. Many elevated portions of the far West had light to moderate falls, chiefly during the last week, a few stations reporting total amounts in excess of a foot.

SUNSHINE AND RELATIVE HUMIDITY

Much cloudy weather prevailed in the Ohio and southern Mississippi Valleys and to the southeastward, in the northern portions of the New England and Lake region, the far Northwest and northern half of the Pacific coast region. Elsewhere, rather a large amount of sunshine prevailed, although throughout the more arid regions of the Southwest less than the average for September was received. The relative humidity was generally below the normal over much of the country, as would be expected because of the deficiency of precipitation for the month in many sections; however, throughout the Southeast, where more than the normal precipitation was received, the humidities were without exception above normal.

SEVERE LOCAL STORMS, SEPTEMBER, 1930

[The table herewith contains such data as have been received concerning severe local storms that occurred during the month. A more complete statement will appear in the Annual Report of the Chief of Bureau]

Place	Date	Time	Width of path, yards [1]	Loss of life	Value of property destroyed	Character of storm	Remarks	Authority
Binghamton, N. Y., and vicinity.	1	4 p. m.		1	$125,000	Wind and rain	Power lines, buildings, trees, and crops damaged.	Official, U. S. Weather Bureau.
Dane County, Wis. (northern).	1	P. m.			250,000	Hail	Severe damage to tobacco and corn crops.	Do.
Harrisburg, Pa., and vicinity.	1	do.			20,000	Electrical	Several barns and contents destroyed.	Do.
Selinsgrove, Pa.	1	do.			10,000	do.	Barn and contents destroyed.	Do.
York, Pa. (near)	1	do.			10,000	do.	do.	Do.
Canon City, Colo.	2					Hail and rain	All fruits, flowers, and vegetables practically destroyed; basements flooded; highways and railroads damaged.	Do.
Eslie, Nebr.	3	5 p. m.	2 mi.		30,000	Hail	Severe crop injury in places; livestock hurt; buildings damaged; path 25 miles long.	Do.
Sutherland, Nebr.	3	do.	3 mi.		25,000	do.	Crops and roofs badly damaged.	Do.
Cimarron, N. Mex., and vicinity.	4	2 p. m.	440		1,500	do.	Considerable damage to roofs, autos, and crops.	Do.
Russell County, Kans.	4	4 p. m.			25,000	do.	do.	Do.
El Dorado and Smackover, Ark.	4				17,000	Wind	No details reported.	Do.
Sugarite, N. Mex., and vicinity.	5	1:15–2 p. m.			5,000	do.	Unharvested wheat and oats in path complete loss.	Do.
Elk Creek, Colo.	5					Hail	No details reported.	Do.
Butte, Nebr. (2 miles south).	6	10 p. m.	4 mi			Hail and rain	Considerable damage in small areas; path 18 miles long.	Do.
Florence, Colo.	6	P. m.			250,000	Hail	Matured crops practically total loss; 200 carloads of vegetables ruined.	Do.
Powder River and Wibaux Counties, Mont.	6					do.	Chief damage to crops.	Do.
Plymouth and Woodbury Counties, Iowa.	7	P. m.			800,000	Hail and wind	Character of damage not reported.	Do.
Carter County, Mont.	7					Hail	Crops injured.	Do.
Norwood, Colo.	7					do.	No details reported.	Do.
Cotton County, Okla. (northeast).	8	4 p. m.	3 mi.		51,000	do.	Heavy crop damage; 1,500 chickens and turkeys killed; path 5 miles long.	Do.
Mountain Home, Ark.	8				4,000	Hail and wind	Character of damage not reported.	Do.
Plaza, Wash.	8					Electrical	Practically 73,000 bushels of grain destroyed.	Do.
Tampa, Fla., and vicinity.	8–9				75,000	Wind and rain	Damage to crops, highways and bridges chiefly by torrential rains.	Do.
Lampassas, Tex. (near)	9	4:30 p. m.	400		1,000	Tornado	Buildings damaged.	Do.
Fallon County, Mont.	11					Hail	260 acres of flax ruined.	Do.
Dickinson and Osceola Counties, Iowa.	12	3–4 p. m.			6,500	Wind and hail	Crops damaged.	Do.
Carteret County, N. C.	12					Wind	Character of damage not reported.	Do.
Raymondsville, Mo.	12				2,000	Wind and rain	Small buildings and haystacks blown down.	Do.
Sedan and Peru, Kans. (vicinity of).	12		2 mi.		5,000	Wind	Oil-pumping station and barns wrecked; trees uprooted; path 20 miles long.	Do.
Rush County, Kans.	13	P. m.	8 mi.			Wind and hail	Many farm buildings blown down.	Do.
Auburn, Nebr.	14	4:30 a. m.	1.5 mi.		10,000	Hail	Corn injured; much glass broken; minor roof damage; path 5 miles long.	Do.
Terre Haute, Ind.	14	A. m.			10,000	Wind	Roof blown from brick and clay works.	Do.
Bellview, N. Mex. (near)	14	Noon–1 p. m.	3–5 mi.			Hail	Crops total loss for 3 miles of path. Path 15 miles long.	Do.
Logan, N. Mex., and vicinity.	14	1–1:20 p. m.			5,000	do.	Crops destroyed or injured.	Do.
Plymouth County, Iowa.	14	1:30 p. m.			5,000	Wind and hail	Crops and livestock injured.	Do.
Fairbury, Nebr. (4 miles south).	14	2 p. m.	2.5 mi.		2,000	Hail	Late melon and garden crops damaged; path 11 miles long.	Do.
Pratt to Isabel, Kans.	14	3:30 p. m.	8 mi.			do.	Crops, roofs, windows, and automobiles damaged; poultry killed; path 25 miles long.	Do.
Freeport, Kans. (4 miles southwest).	14	5:15 p. m.	50		12,000	Tornado	Buildings on 2 farms demolished; farm implements damaged; livestock injured; path 1 mile long.	Do.

[1] "Mi." signifies miles instead of yards.